Impact of Educational Intervention Program on Diabetic Retinopathy Patient's Compliance

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Abstract   Background; diabetic retinopathy can lead to serious vision problems, patient education plays an important role in the management of retinopathy and the Compliance to treatment is a primary determinant of treatment success. **Aim of the Study;** The study aimed to evaluate the Impact of educational intervention program on diabetic retinopathy patient's compliance. **Study Hypothesis;** Patients knowledge about diabetic retinopathy will be improve post program than before and Patients compliance will improved after receiving the program. **Design;** Quasi experimental design used to achieve the aim of the study. **Setting**; the study was conducted at ophthalmology clinic at Benha University Hospital. **Subjects;** Convenience sample of 60 patients from both genders selected under criteria. **Tools**: two tools were used; Structured questionnaire regarding knowledge of diabetic and diabetic retinopathy**;** which used to assess patient's knowledge about diabetic and diabetic retinopathy and patient's compliance of diabetic retinopathy; to assess patient' compliance It included questionnaire about nutrition and eating habits , physical activity and treatment. **Results;** mean score of age was age 42.067 ± 9.716 also 56.7% are male, (78.3%) are married. Regarding to medical history 70.0% use insulin. and so 78.3% of them post hyperglycemia exposure caused by Sweet diet. Regarding total knowledge pre-program was 93.3 % of patients had unsatisfactory while 80.0%   had satisfactory of knowledge post program**.** Regarding total compliance 95.0 % of patients not adherent preprogram while 96.7% had adherent post program. Also there were positive and highly significant correlations in post program between total knowledge and total compliance**. Conclusion**: there were highly significant statistically improvement in all items of knowledge and compliance post than preprogram regarding diabetic retinopathy. **Recommendations;** The need for increasing awareness and also the provision of access to retinopathy screening services to patient, Urgent need to evolve strategies to educate diabetic patients about potential retinopathy complication of diabetes.

Keywords: diabetic retinopathy, patient's compliance, Benha University

Cite This Article: Sabah S. Mohamed, Rasha Fathy Mohamed, and Safa Hamed Mohamed, "Impact of Educational Intervention Program on Diabetic Retinopathy Patient's Compliance." *American Journal of Nursing Research*, vol. 7, no. 6 (2019): 1000-1008. doi: 10.12691/ajnr-7-6-14.

1. Introduction

Retinopathy(DR) is a common complication in diabetic patients, and one of the main causes of blindness in ophthalmology, the prevalence of blindness reaches 30% especially in diabetic patients with proliferative diabetic retinopathy within two years [1,2]. This is when high blood sugar levels cause damage to blood vessels in the retina. These blood vessels can swell and leak or they can close, stopping blood from passing through. Sometimes abnormal new blood vessels grow on the retina. All of these changes can steal the vision [3].

Complications of diabetic retinopathy can lead to serious vision problems, including; vitreous hemorrhage occurs when new blood vessels bleed into the vitreous fluid, retinal detachment develops when damaged blood vessels form scar tissue and Glaucoma. This condition can

lead to damage in the optic nerve, the bundle of nerve fibers that transmits visual information from the eye to the brain. If left untreated, glaucoma may cause permanent blindness [4]. The complications of diabetes can have a devastating effect on patients and their families. This is often intensified by the loss of a patient's ability to self-manage, which may have physical and psychosocial implications [5].

All nurses who care for patients with diabetes have an important role to play in preventing complications, and it is important to establish clear communication between the health professionals in different disciplines in all settings who provide care for these patients [5]. Patients with diabetic retinopathy can be management by controlling their blood sugar levels, exercising regularly, keeping to a healthy diet and also take their prescribed medication. Those who smoke need to quit and avoid alcohol as much as possible. Because earliest stages of diabetic retinopathy have no detectable visual symptoms, diabetics need to have their vision tested regularly with a dilated

eye examine to catch this condition while it is still treatable [6].

Patient education plays an important role in the management of retinopathy, as increased awareness is linked with motivation to adhere to self-management goals patients with sight-threatening retinopathy may need educating regarding a potential loss of vision as well as a clear explanation of the treatment options [5].

Compliance to treatment is a primary determinant of treatment success. The term compliance describes the extent to which patients follow treatment recommendations given by their health care providers. The rate of treatment compliance varies according to the disease characteristics, treatment regime and patient features. The noncompliance rate in chronic disorders is known to be about 50% on average. Compliance with treatment is very important in managing diabetes. Patients requiring a change in their usual lifestyle to comply with the rules of treatment may experience compliance problems. In diabetic patients, noncompliance means poor glycemic control and long-term health complications, such as retinopathy, neuropathy, and renal disease [7].

1.1. Significance of the Study

Background retinopathy will eventually progress to the more severe forms in the majority of individuals. If left untreated, 50% of those with proliferative DR will lose their sight within two years and 90% risk losing any useful vision after 10 years. Patients who undergo treatment have their risk of moderate visual loss reduced from 30% to 15% over the subsequent three years. Those who have PRP have their risk of severe visual loss reduced by 50%, compared with untreated individuals with a similar severity of disease [8]. DR is one of the leading causes of blindness in the world. It develops in nearly all individuals with type 1 diabetes and in more than 75% of individuals with type 2 who survive for over 20 years with the disease [9].

1.2. Aim of the Study

The study aimed to evaluate the impact of educational intervention program on diabetic retinopathy patient's compliance; this aim will be achieved through the following:
• Assessing patient's knowledge of diabetic retinopathy.
• Developing and implementing program of diabetic retinopathy for the studied patients
• Evaluate the impact of implementing the program of diabetic retinopathy on patient's compliance.

1.3. Study Hypothesis

1. Patients knowledge about diabetic retinopathy will be improved post program than pre-program.
2. Patients compliance will improved after receiving the program.

2. Subjects and Method

2.1. Research Design

Quasi experimental design used to achieve the aim of the study.

2.2. Research Setting

The study was conducted at ophthalmology clinic at Benha University Hospital

2.3. Research Subjects

Convenience sample of 60 patients from both genders selected under the following criteria:
1. Accept to participate in the study.
2. All patients have diabetic more than 5 years.
3. Adult male and female from 20 – 60 years.

2.4. Tools of Data Collection

Two tools were designed to collect data
Tool (I): Structured questionnaire regarding knowledge of diabetic and diabetic retinopathy; which was developed by the researchers to assess patient's knowledge about diabetic and diabetic retinopathy. It included four parts;

A. Demographic characteristics of the patients: as age, gender, marital status, educational level, residence and occupation.

B. Medical history of the patients: such as: weight, height, duration of diabetic, family history of diabetic , types of treatment and complication of diabetic.

C. Patient's Knowledge about diabetic including: Meaning of diabetic mellitus causes, s&s, risk factors, diagnosis, treatment and complication

D. **Patient's Knowledge about diabetic retinopathy** including: meaning, causes, types , signs& symptoms , risk factors, diagnosis , a complication and prevention.
Knowledge scoring system:

All knowledge variables were weighted according to the items included in the answer of each question. The data collected from the knowledge test was computed and the test received a grade out of 18 questions, the scores were allocated as follows: complete (2), incomplete (1), wrong (0).

The total score of all questions will be represented in 100% and categorized into two levels, unsatisfactory (<60%) and satisfactory ($\geq$ 60%).

Tool (II): patient's compliance of diabetic retinopathy It was developed by the researchers to assess patient's compliance for medication, physical activity and diet. Compliance was measure by using questionnaire about nutrition and eating habits (19items), physical activity (6 items) and treatment (7 items).
Scoring system:

Scoring of patient compliance was assigned to score according to its number of sub-items. For each sub-item, if Adherence (1), and if not adherence (zero) would be given. The scoring system of the compliance tool was computed and the sheet received a grade out of total 32points.

The total score of all questions will be represented in 100% and categorized into two levels, not adherent (<60%) and adherent ($\geq$ 60%)

2.5. Tools Validity and Reliability

The experts check the relevancy, clarity, comprehensiveness and applicability of the tools. According to their opinions

appropriate modifications were done by seven professions and experts of medical surgical nursing in the faculty of nursing and medicine at Benha University. Reliability was done by cronbach, alpha test (0.87).

2.6. Pilot Study

A pilot study was carried out on 6 patients of study to test the content of the questionnaire as well as to estimate the time needed for data collection and the necessary modifications were done. Patients who shared in the pilot study were excluded from the study sample.

2.7. Ethical Considerations

The purpose of the study was explained to the patients and informed consent was obtained from them to participate in the study. They were given an opportunity to withdraw from the study without given a reason, they were assured that anonymity and confidentiality of information was protected. Ethics, values, culture, and beliefs were respected. Also the approval taken from the Ethics Committee in the Faculty of Nursing to conduct this study.

2.8. Field Work: - Preparatory Phase

Designed educational intervention program was developed by the researchers after review of literatures, then revised and modified according to the expertise comments, it was written in clear, Arabic language with pictures, colors and it included tow part: theoretical part (knowledge about meaning of diabetic, causes, diagnosis, treatment and complication. knowledge about diabetic retinopathy; types, causes, singes and symptoms, treatment and precaution). Practical part (compliance) which include nutrition and eating habits, physical activity and treatment of diabetic retinopathy.

Assessment phase:
At the beginning the researchers visited the ophthalmology clinic to collect necessary data about working days (from three day of week), frequency of cases (about 2 to 6 cases per week) and get the agreement to conduct the research .The researchers meets the patient after a registration to clinic time (9 am to 10 am) and introduces their self; explain the aim of the study to each patient to gain their cooperation to share in the study. The researchers initiated data collection by interviewing each participant for assessing socio-demographic data, medical and family history by using a structured interviewing questionnaire. Also, each patient was asked to answer certain questions to evaluate his knowledge about diabetic, diabetic retinopathy, instructions about diet, physical activity ,healthy life style. The average number per day around one patients and each patient took an average 10-15 minutes.

Implementation phase:
The intervention program was developed and implemented for the studied patients. They attended two sessions; the first was included health education about general information about diabetes as; definition, causes, diagnosis, treatment strategies and complication. The duration of the session was 15-20 minute .Second session which included information about diabetic retinopathy (definition, causes, diagnosis, treatment strategies and complication), knowledge about compliance health diet, physical activity and treatment. The duration of the session was 15-20 minute .Each session followed by a summary of essential points. The teaching media included an illustrative structured colored booklet.

Evaluation phase:
At the end of the sessions the evaluation of the educational program were done post implementation regarding their knowledge, and their compliance using the same tools that was used in the pretest .

2.9. Statistical Analysis

Upon completion of data collection through the previously mentioned tools, data were computed and analyzed using the Statistical Package for Social Sciences (SPSS), version 20.0.0.0. Data were presented in tables using numbers, percentages, personal correlation, X2 and P value. Level of significance was threshold at 0.05.

3. Results

Table 1: Socio-demographic characteristics of the studied patients**.** This table shows that regarding to age 56.7% of the studied group ranged between 41- 60 years old also 56.7% are male, (78.3%) are married. Regarding to residence 51.7% was from rural areas, 40.00% illiterates. As well as, regarding to occupation 38.3% not working.

Table 2: Description of medical data among the studied patients. This table shows that regarding to medical history 45.0% of the studied group the duration of their diabetic ranged between-5- 10 years. The 68.3% of the studied group have family suffering of diabetic & measurement of hemoglobin. Also 70.0% have treatment by insulin. Also shows that 66.7% had eye complication from diabetic, and so 78.3% of them post hyperglycemia exposure caused by Sweet diet. Finally 80.0% make eye examine from one year to less 3 years.

Table 3: Distribution of Knowledge regarding diabetes mellitus for studied patients between pre and post program implementation. This table showed that 43.3% and 46.7% of patients had the poor levels of knowledge preprogram implementation regarding symptom of diabetic and importance of eye disease respectively. While post program implementation they was 81.7% and 83.3% of patients were good level of knowledge in define and important of eye diseases.

Table 4: Distribution of knowledge regarding retoinophy for studied patients between pre and post program implementation. This table showed that 53.3% of patients had the lowest levels of knowledge preprogram implementation among all subjects. While post program implementation they were was the majority of knowledge (81.7%) in changes, loss of vision, investigation or Diagnosis and ways of prevention in diabetic retinopathy, besides (80.0%) in define, stage, Persons at risk and types of treatment in diabetic retinopathy. With a highly signification different between knowledge level (pre &post program implementations).

Table 1. Socio-demographic characteristics of the studied patients (N=60)

Demographic characteristics	No.	%
Age		
20<30	11	18.3
31< 40	15	25.0
41≤60	34	56.7
Mean ± SD	42.067 ± 9.716	
Gender		
Male	34	56.7
Female	26	43.3
Marital status		
Single	3	5.0
Married	47	78.3
Divorced or widower	10	16.7
Residence		
Rural	31	51.7
Urban	29	48.3
Level of Education		
Illiterate	24	40.0
Read&write	20	33.3
Secondary	6	10.0
University	10	16.7
Occupation		
Not working	9	15.0
Worker	23	38.3
Employee	9	15.0
Housewife	19	31.6

Table 2. Distribution of medical data among the studied patients (N=60)

Medical Data	No.	%
Duration of diabetes		
5-10years	27	45.0
11-15years	14	23.3
16-20years	19	31.7
Family suffering of DM		
Yes	41	68.3
No	19	31.7
Measurement of hemoglobin		
Yes	41	68.3
No	19	31.7
Percent of hemoglobin (Mean±SD)	7.7073 ± 1.52	
Type of treatment		
Tablets	7	11.7
Insulin	42	70.0
Tablets& Insulin	11	18.3
Post hyperglycemia exposure		
Yes	47	78.3
No	13	21.7
Causes of Post hyperglycemia		
No	13	21.7
Sweet diet	21	35.0
Meal	9	15.0
Neglected treatment	7	11.7
Psychological cause	10	16.7
Eye exam		
Yes	48	80.0
No	12	20.0
The last eye exam		
NO eye exam	12	20.0
6 month-less one year	14	23.3
One year-less 3 years	22	36.7
3 year-5 years	12	20.0

Table 3. Distribution of Knowledge regarding diabetes mellitus for studied patients between pre and post program implementation (n= 60)

Total Knowledge	Pre Program		Post program		X^2	P Value
Define						
• Poor	26	43.3	0	0.0	83.39	0.000**
• Average	34	56.7	11	18.3		
• Good	0	0.0	49	81.7		
Symptom of DM						
• Poor	28	46.7	2	3.3	75.5	0.000**
• Average	32	53.3	13	21.7		
• Good	0	0.0	45	75.0		
Cause of DM						
• Poor	16	26.6	0	0.0	82.28	0.000**
• Average	44	73.3	12	20.0		
• Good	0.0	0.0	48	80.0		
Hight risk for DM						
• Poor	26	43.3	1	1.7	82.9	0.00**
• Average	34	56.7	11	18.3		
• Good	0	0.0	48	80.0		
Types of DM						
• Poor	28	46.7	0	0.0	83.02	0.000**
• Average	32	53.3	13	21.7		
• Good	0	0.0	47	78.3		
Diagnosis of DM						
• Poor	18	30.0	3	5.0	82.83	0.000**
• Average	42	70.0	8	13.3		
• Good	0	0.0	49	81.7		
Investigation of DM						
• Poor	23	38.3	3	5.0	73.14	0.000**
• Average	37	61.7	12	20.0		
• Good	0	0.0	45	75.0		
Complication of DM						
• Poor	13	21.7	0	0.0	79.26	0.000**
• Average	47	78.3	13	21.7		
• Good	0	0.0	47	78.3		
Importance of eye disease						
• Poor	28	46.7	0	0.0	88.16	0.000**
• Average	32	53.3	10	16.7		
• Good	0	0.0	50	83.3		

Table 4. Distribution of Knowledge regarding retinophy for studied patients between pre and post program implementation (n= 60)

Total Knowledge	Pre Program		Post program		X²	P Value
Define						
• Poor	26	43.3	1	1.7	75.75	0.000
• Average	32	53.3	11	18.3		
• Good	2	3.3	48	80.0		
Cause of retinopathy						
• Poor	25	41.7	2	3.3	68.58	0.000
• Average	32	53.3	11	18.3		
• Good	3	5.0	47	78.3		
stage of retinopathy						
• Poor	26	43.3	1	1.7	75.75	0.000
• Average	32	53.3	11	18.3		
• Good	2	3.3	48	80.0		
Changes of retinopathy						
• Poor	27	45.0	1	1.7	81.75	0.000
• Average	32	53.3	10	16.7		
• Good	1	1.7	49	81.7		
Signs& Symptom of retinopathy						
• Poor	26	43.3	2	3.3	72.15	0.000
• Average	32	53.3	11	18.3		
• Good	2	3.3	47	78.3		
loss of vision in DR						
• Poor	26	43.3	0	0.0	79.57	0.000
• Average	32	53.3	11	18.3		
• Good	2	3.3	49	81.7		
Persons at risk for DM						
• Poor	26	43.3	1	1.7	75.72	0.000
• Average	32	53.3	11	18.3		
• Good	2	3.3	48	80.0		
Investigation or Diagnosis of retinopathy						
• Poor	24	40.0	1	1.7	70.89	0.000
• Average	32	53.3	10	16.7		
• Good	4	6.7	49	81.7		
Complication of retinopathy						
• Poor	26	43.3	3	5.0	71.09	0.000
• Average	32	53.3	10	16.7		
• Good	2	3.3	47	78.3		
Ways of prevention						
• Poor	26	43.3	0	0.0	79.57	0.000
• Average	32	53.3	11	18.3		
• Good	2	3.3	49	81.7		
Types of treatment						
• Poor	26	43.3	1	1.7	75.62	0.000
• Average	32	53.3	11	18.3		
• Good	2	3.3	48	80.0		

* P < 0.05 (significant), ** p-0.000 (highly significant).

Figure 1: Distribution of total knowledge pre and post program implementation among studied patients. This figure shows that 93.3 % of the studied patients had unsatisfactory of knowledge preprogram implementation. While 80.0% of the studied patients had satisfactory of knowledge post program implementation. There were highly statistically significant differences observed with P= 0.00.

Table 5: Distribution of compliance items among studied patients' related to pre and post program implementation. This table showed that 96.7% and 95.0% of patients not adherent preprogram implementation regarding with diet & treatment respectively. As compare of 85.0% & 83.3 had adherent post program implementation regarding with diet & treatment respectively. There were highly statistically significant differences observed with P< (0.00).

Figure 2: Total compliance pre and post program implementation among studied group. This shows that 95.0 % of studied patients not adherent preprogram implementation .While 96.7% had adherent post program implementation. There were highly statistically significant differences observed with P= 0.00.

Table 6: shows Correlations between total knowledge, and total compliance pre and post program implementation. There were positive and highly significant correlations in post program.

Table 7: Relation between total diet compliance and selected soici-demographic variables among studied patients with retinopathy. This table reveals that there are highly statistically significant in relation between socio-demographic variable (age, duration of diabetes) and total diet compliance preprogram while there were no statistically significant post program.

Table 8: Relation between total activity compliance and selected variables among studied patients with retinopathy. This table reveals that there no statistically significant relation between sociodemographic data and total activity compliance pre and post program.

Table 9: Relation between total treatment compliance and selected variables among studied patients with retinopathy. This table reveals that there no statistically significant relation between sociodemographic data and total treatment compliance pre and post program.
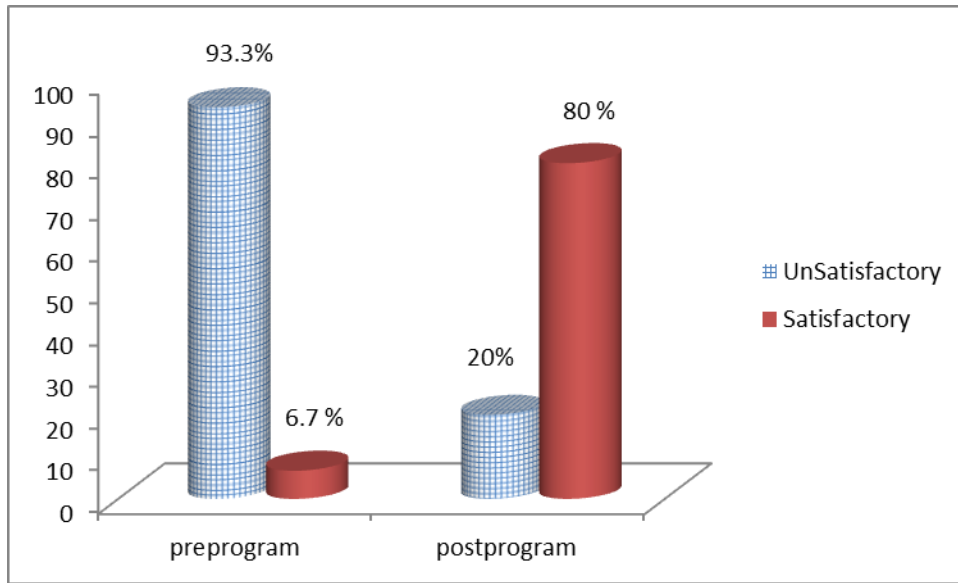
Figure 1. Distribution of total knowledge pre and post program implementation among studied group (n = 60)

Table 5. Distribution of compliance items among studied patients' related to pre and post program implementation.

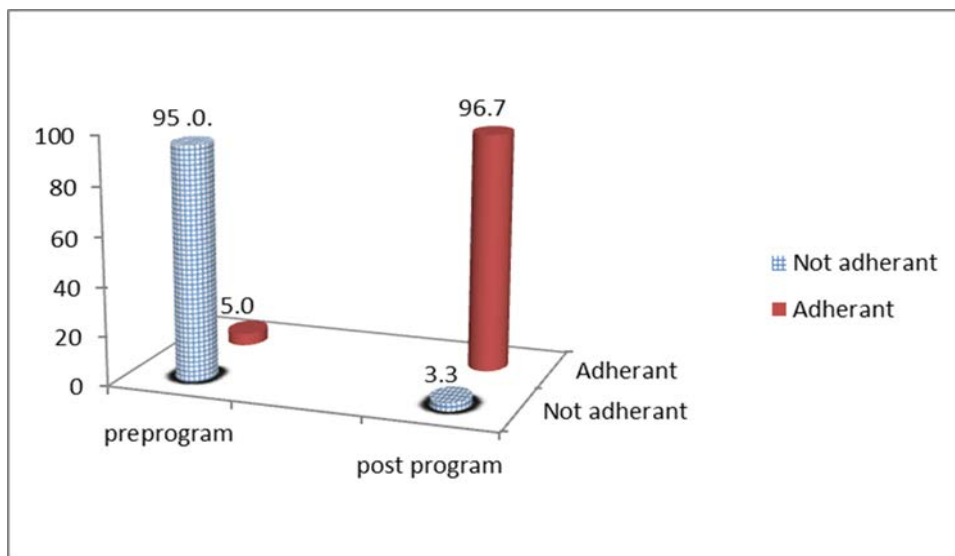| Total Compliance	Pre Program		Post program		X^2	P Value
	N.	%	N.	%		
Diet						
• Not adherent	57	95.0	9	15.0	77.58	0.000
• Adherent	3	5.0	51	85.0		
Activity						
• Not adherent	41	68.3	12	20.0	28.42	0.000
• Adherent	19	31.7	48	80.0		
Treatment						
• Not adherent	58	96.7	10	16.6	78.19	0.000
• Adherent	2	3.3	50	83.3		

Figure 2. Distribution total compliance for studied patients' pre and post program implementation (N=60) ($X^2= 100.86(p=0.00)$)

Table 6. Correlations between total knowledge, and total compliance pre and post program implementation

Items		Total compliance	
		Pre program	Post program
Total knowledge	r	0.136	0.421
	P value	0.293	0.001**

Table 7. Relation between total diet compliance and selected variables among studied patients with retinopathy

Variables	Diet							
	Pre- program				Post-program			
	Not adherent No. (%)	Adherent No. (%)	X²	P value	Not adherent No. (%)	Adherent No. (%)	X²	P value
Age								
20<30	7(63.6)	4(36.4)			2(18.2)	9(81.8)		
31< 40	12(80.0)	3(20.0)	8.803	0.012*	1(6.7)	14(93.3)	1.09	0.579
41≤60	33(79.1)	1(2.9)			6(17.6)	28(82.4)		
Gender								
Male	31(91.2)	3(8.8)	1.381	0.240	7(20.6)	27(79.4)	1.922	0.166
Female	21(80.8)	5(19.2)			2(7.7)	24(92.3)		
Level of Education								
Illiterate	19(95.0)	1(5.0)			3(15.0)	17(85.0)		
Read &write	18(75.0)	6(25.0)	5.048	0.168	2(8.3)	22(91.7)	1.01	0.799
Secondary	6(100.0)	0(0.0)			1(16.7)	5(83.3)		
University	9(90.0)	1(10.0)			2(20.0)	8(80.0)		
Duration of diabetes								
5-10years	19(70.4)	8(29.6)			4(14.8)	23(85.2)		
11-15years	14(100)	0(0.00)	11.282	0.004*	2(14.3)	12(85.7)	0.016	0.992
16-20years	19(100)	1(0.00)			3(15.8)	16(84.2)		

Table 8. Relation between total activity compliance and selected variables among studied patients with retinopathy

Variables	Activity							
	Pre- program				Post-program			
	Not adherent No. (%)	Adherent No. (%)	X2	P value	Not adherent No. (%)	Adherent No. (%)	X²	P value
Age								
20<30	8(72.7)	3(27.3)			1(9.1)	10(90.9)		
31< 40	10(66.7)	5(33.3)	0.514	0.773	4(26.7)	11(73.3)	1.242	0.537
41≤60	26(76.5)	8(23.5)			7(20.6)	27(79.4)		
Gender								
Male	26(76.5)	8(23.5)	0.395	0.53	11(32.4)	23(67.6)	1.187	0.276
Female	18(69.2)	8(30.8)			12(46.2)	14(53.8)		
Level of Education								
Illiterate	20(83.3)	4(16.7)			9(37.5)	15(62.5)		
Read &write	14(70.0)	6(30.0)	2.386	0.496	8(40.0)	12(60.0)	3.813	0.282
Secondary	4(66.7)	2(33.3)			1(16.7)	5(83.3)		
University	6(60.0)	4(40.0)			1(10.0)	9(90.0)		
Duration of diabetes								
5-10years	20(74.1)	7(25.9)			5(81.5)	22(81.5)		
11-15years	11(78.6)	3(21.4)	0.438	0.803	4(28.6)	10(71.4)	0.89	0.641
16-20years	13(68.4)	6(31.6)			3(15.8)	16(84.2)		

Table 9. Relation between total activity compliance and selected variables among studied patients with retinopathy

Variables	Treatment							
	Pre- program				Post-program			
	Not adherent No. (%)	Adherent No. (%)	X²	P value	Not adherent No. (%)	Adherent No. (%)	X²	P value
Age								
20<30	10(90.9)	1(9.1)			3(27.3)	8(72.7)		
31< 40	12(80.0)	3(20.0)	0.821	0.663	5(33.3)	10(66.7)	0.939	0.625
41≤60	30(88.2)	4(11.8)			7(20.6)	27(79.4)		
Gender								
Male	30(88.2)	4(11.8)	1.209	0.271	8(23.5)	26(76.5)	2.66	0.103
Female	25(96.2)	1(3.8)			2(7.7)	24(92.3)		
Level of Education								
Illiterate	22(91.7)	2(8.3)			9(37.5)	15(62.5)		
Read &write	17(85.0)	3(15.0)	5.16	0.160	4(20.0)	16(80.0)	3.214	0.360
Secondary	5(83.3)	1(16.7)			3(50.0)	3(50.0)		
University	6(60.0)	4(0.0)			2(20.0)	8980.0)		
Duration of diabetes								
5-10years	22(81.5)	5(18.5)			5(18.7)	22(81.5)		
11-15years	11(78.6)	3(21.4)	4.345	0.114	1(7.1)	13(92.9)	1.98	0.372
16-20years	19(100)	0(0.00)			5(26.3)	14(73.7)		

4. Discussion

The number of patients diagnosed with diabetes worldwide is projected to increase from 415 million in 2015 to 642 million in 2040, putting these patients at an increased risk for developing other comorbidities. Retinopathy is a common complication in diabetic patients, and one of the main causes of blindness in ophthalmology. Therefore the study aimed to evaluate the Impact of educational intervention program on diabetic retinopathy patient's compliance at Benha University Hospital. The discussion of current study cover four main parts; the first part Socio-demographic characteristics of patients and patient medical history, second part patient's knowledge pre/post program, the third part patient's compliance pre / post program, and finally the relations between some variables of patient's characteristics and compliance.

Regarding age, the present study revealed that about half of the studied subjects were in the age category between 41- 60 years old. This result agreed with the study conducted by [10] about "Diabetic retinopathy management guidelines" and found that, most of patient's in age category (45-64) years old. In the same line with the study conduct by [11] about "Epidemiology of diabetic retinopathy in Egypt: a hospital-based study" which showed that most patient in age 49 years old.

The present study revealed 56.7% of studied subject had males, 40 % illiterate , 38.3% un working, 51.7% from rural places and 78.3% married. This result may attribute to more stressors they had. The results of study in line with [12] who studied "Factors that influence the patient uptake of diabetic retinopathy" which showed that 58 % of the study subjects were males. In congruence with the study of [13] about "Effectiveness of Health Education on Knowledge and Attitude Regarding Diabetes in Type II Diabetes Mellitus" who documented 40% being illiterates and unemployed 67%. This result disagreed with the study conduct by [11] who reported the prevalence of DR was statistically significantly higher in females .Also disagreed with [14] who studied "Improving of Type 2 Diabetic Patients' Knowledge, Attitude and Practice Towards Diabetes Self-care" which showed that The majority of participants in all groups are females.

Regarding to medical history; the result revealed more than two fifths (forty five percent) of studied subject had diabetic from 5-10 years, about two third had eye complication from diabetic, and the majority of them make eye examine from one year to less 3 years. This result agree with [11] who reported that 82% of patients with longer diabetes disease duration .Also in the same line with [12] which showed that Twenty-eight percent had a history of diabetic retinopathy and/or other eye disease, 33% screen diabetic retinopathy or other eye disease.

The second part of the discussion was regarding the effect of program intervention on patient's general knowledge about diabetic, the results of study revealed that there was highly significant improvement in the level of knowledge after implementing the program than before included knowledge related to define of DM & diagnosis, causes & important of eye diseases). This result supported by [15] who study "The effect of educational intervention on knowledge, attitude and glycemic control in patients with type 2 diabetes mellitus". They showed significant improvement in knowledge was observed after intervention regarding symptoms of diabetes, risk factors, complications, In this respected [16] about" Health education intervention on diabetes in Sikkim" documented_Majority participants had poor knowledge about diabetes and negative attitude towards the disease before the health education intervention and improved after the intervention.

Regarding the effect of intervention program on patient's knowledge about diabetic retinopathy, the results revealed that there was highly significant improvement in the level of knowledge after implementing the program than before. This result supported by [17] who stressed "Influencing factors on compliance of timely visits among patients with proliferative diabetic retinopathy in southern China: a qualitative study" who report that majority participants had poor knowledge about diabetes retinopathy before the health education intervention and improved after the intervention. In congruence with this, [18] about "Knowledge of diabetes and diabetic retinopathy among rural populations in India, and the influence of knowledge of diabetic retinopathy on attitude and practice". Reported only half of the population studied knew about the effect of good control of diabetes on DR.

The third part of the discussion was regarding the effect of program intervention on patient's compliance of diabetic retinopathy; the result revealed highly statistically significant differences between pre and post program. Which indicated that not adherent preprogram implementation regarding medication & diet, while adherent post program. This result supported by [19] about "Medication adherence in patients with type 2 diabetes mellitus treated at primary health clinics in Malaysia" who document adherence was observed only in study population. Also recommended that patient education on medication regimens is essential in order to improve adherence.

The researchers' opinions pointed out the difficulties resulting from following an appropriate diet. A lack of good knowledge about recommended products and their availability on the market was the most common problem reported by participating families. A proper understanding of portion sizes was also problematic. Moreover, cultural and social barriers were one of the main obstacles in introducing the diet. Numerous subjects of the study normally do not consume products recommended for diabetic patients.

The four part of the discussion was regarding the relations between items of compliance (diet, physical activity, treatment) and selected soico-demographic variables (age, level of education, gender) and duration of diabetes among studied patients. The current results revealed that there was statistical significant preprogram between age, duration of diabetes and diet compliance (p= 0.012 and p= 0.004) respectively. While in post program there were no statistical significant. The study was disagree with [20] about "Adherence to dietary recommendations in diabetes mellitus: disease acceptance as a potential mediator" reported that no statistically significant difference was found between the socio-demographic variables and non-adherence to diet preprogram.

Regarding the relation of items of compliance and duration of diabetic, the study revealed that there was

statistical differences pre- program (p= 0.004), this mean the patients who 15-20years of duration of diabetes were more adherence of diet than 5-10 years of duration. But post program the majority of patient with diabetic from 5-10 years adherence to diet. The researchers thought if the patients understand and know about their disease and the treatment, they will be better able to understand the importance of the recommendations and adhere to the activities that multi-professional health team has programmed.

This result was disagree with [21] who study "Adherence to diabetes mellitus treatment and socio-demographic, clinical and metabolic control variables " the studies show that patients with a shorter length of diagnosis and in the initial phase of the treatment are less adherent to the treatment and to self-care in diabetes.

Therefore, it seems to be a key importance for diabetic patients to gain knowledge about diet, physical activity and treatment from health care provider, as well as receive support from their closest environment. To adherent to their treatment

5. Conclusion

In the face of our results, the present study illustrated that there were highly significant statistically improvement in all items of knowledge and compliance post than pre- program regarding diabetic retinopathy.

6. Recommendation

In the light of the results of the current study, the following recommendations are suggested:
-   The need for increasing awareness and also the provision of access to retinopathy screening services to patient.
-   Urgent need to evolve strategies to educate diabetic patients about potential retinopathy complication of diabetes.
-   Further research is necessary to measure long term adherence to healthy life style among patients with diabetic retinopathy.

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